

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 June 2005 (23.06.2005)

PCT

(10) International Publication Number
WO 2005/057617 A3

(51) International Patent Classification:
H01L 23/48 (2006.01)

(21) International Application Number:
PCT/US2004/040197

(22) International Filing Date:
1 December 2004 (01.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/526,926 2 December 2003 (02.12.2003) US

(71) Applicant (for all designated States except US): **GREAT WALL SEMICONDUCTOR CORPORATION** [US/US]; P.O. Box 24619, Southern Avenue, Tempe, AZ 85285-4619 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **ANDERSON, Samuel** [US/US]; 911 West Diamond Drive, Tempe, AZ 85283 (US).

(74) Agents: **US, Natasha, C. et al.**; Goodwin Procter LLP, Exchange Place, Boston, MA 02109 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

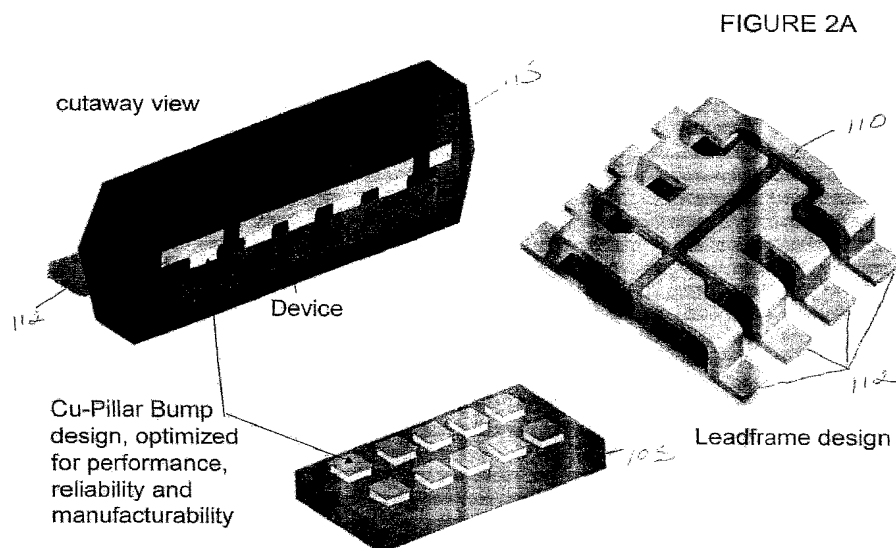
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:
26 February 2009

(54) Title: **BOND WIRELESS PACKAGE**



(57) Abstract: There is provided herein exemplary embodiments of a semiconductor device constructed in accordance with the present invention. The device comprises: a semiconductor chip (105) having a lateral power transistor formed therein. The chip (105) has an upper surface and source, drain and gate contact terminals on the upper surface thereof. Each of the source, drain and gate contact terminals have a conductive ball (106) or pillar thereon. A metal lead frame (110) spans the upper surface of the chip, the metal lead frame (110) being in electrical contact with the conductive balls or pillar bumps. A capsule (115) encases the chip (105) and at least a portion of the metal lead frame (110) such that opposite ends of the metal lead frame protrudes from opposite sides of the capsule (115).

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/40197

A. CLASSIFICATION OF SUBJECT MATTER

IPC: H01L 23/48(2006.01)

USPC: 257/666,676,737,738,778

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/666, 676, 737, 738, 778

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,945,730 A (SICARD et al) 31 August 1999 (31.08.1999), column 2, lines 37-50, column 3, line 13, Figure 2.	1-25
A	US 6,861,702 A (KITAMURA) 1 March 2005 (01.03.2005)	
A	US 6,674,157 A (LANG) 6 January 2004 (06.01.2004)	

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

13 April 2006 (13.04.2006)

Date of mailing of the international search report

21 NOV 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

Roy Potter

Telephone No. 571 272 1842